

ABSTRACT OF THE DISCLOSURE

A quantum communication apparatus is used in operations to generate entanglement between the two physical system ensembles and operations to extend the distance between entangled ensembles by connecting pairs of entangled ensembles. The apparatus uses only passive elements without any actuating parts, active devices having no mechanically actuating parts, such as an electro-optical device capable of ultrahigh-speed operation, and a laser source capable of generating high-speed pulse trains or a continuous wave laser source. The apparatus can rapidly execute light irradiation necessary for entanglement generation and connection, and detection of a generated photon at the needed sites within a decoherence time of the physical system.